City of Seattle CIP Supplements

to the

LEED Green Building Rating System™

A Handbook for Achieving LEED Silver™ and beyond on City of Seattle Capital Improvement Projects

Version 2 (March 2001)

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Note: *The City of Seattle Green Building Team thanks the US Green Building Council for permission to reproduce the "REQUIREMENT:" section of the* LEED Rating System™ *(identified by the gray boxes within this document). The language appears here to facilitate the use of this document, and in no way substitutes for using the* LEED Rating System™ *itself or its supplementary documents. Project managers and design teams should also obtain the* LEED Rating System™ *and* LEED™ Reference Guide. *Learn more about LEED™ and the certification process at www.usgbc.org. Note also that these Supplements focus primarily on* ***local*** *resources, contacts and requirements. Consult the official USGBC LEED materials for LEED™ referenced standards and protocols and national resources.*

Seattle's Sustainable Building Policy

BACKGROUND
On February 22nd, 2000 the Seattle City Council unanimously endorsed the **Sustainable Building Policy** which is part of the City's Environmental Management Program. The Office of Sustainability and Environment guides City operations toward environmental stewardship by coordinating implementation of Seattle's Environmental Management Program (EMP). The mission of the EMP is to foster the City's compliance with environmental laws, to assist departments to reduce environmental impacts from operations, and to improve environmental performance. Areas of City operations that most impact the environment have been identified, from landscape management to use of chemicals to fleet fuel use. Policies to improve the City's environmental performance in each of those areas have been developed for inclusion in the EMP. The Green Building Team,[1] an interdepartmental committee of technical, policy and program staff, was formed to develop the sustainable building policy and to plan for its implementation.

WHY A CITY POLICY?
A Citywide policy on sustainable building demonstrates the City's commitment to environmental, economic, and social stewardship; yields cost savings to the City taxpayers through reduced operating costs; provides healthy work environments for staff and visitors; and contributes to the City's goals of protecting, conserving, and enhancing the region's environmental resources. Additionally, the City helps set a community standard of sustainable building.

WHAT IS SUSTAINABLE BUILDING?
Sustainable building integrates building materials, systems and methods that promote environmental quality, economic vitality, and social benefit through the design, construction and operation of the built environment. Sustainable building merges sound, environmentally responsible practices into one discipline that looks at the environmental, economic and social effects of a building or built project as a whole. The entire lifecycle of the built environment is included (planning, design, construction, operation and maintenance, and demolition or disassembly). Sustainable building design encompasses the following broad topics: efficient management of energy and water resources, management of material resources and waste, protection of environmental quality, protection of health and indoor environmental quality, reinforcement of natural systems, and integrating the design approach.

Sustainability is "Meeting the needs of the present without compromising the ability of future generations to meet their own needs." The concept of sustainable building is derived from this broader definition of sustainability. Sustainability seeks to balance concerns for continuing growth and human development with concern for the well being of the planet. Concepts of sustainability and sustainable building must expand to include community and social issues, spiritual beliefs, restorative acts versus just maintaining survival, and hope for an abundant future.

> In its original context, this (*sustainability*) definition was stated solely from the human point of view. In order to embrace the idea of a global ecology with intrinsic value, the meaning must be expanded to allow all parts of nature to meet their own needs now and in the future…. Sustainable design is the conception and realization of ecologically, economically and ethically responsible expression as part of the evolving matrix of nature.[2]

Grateful acknowledgements to Tom Paladino, Lynne Barker, Elizabeth Daniel, and Lucia Athens for source info.

[1] The Green Building Team includes representatives from the Office of Sustainability and Environment, City Light, DCLU, Seattle Public Utilities, Parks, Executive Services and the Seattle Lighting Design Lab.
[2] William McDonough, *The Hannover Principles: Design for Sustainability*.

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WHY IS SUSTAINABLE BUILDING IMPORTANT?

The building industry is the nation's largest manufacturing activity, representing 13% of Gross Domestic Product. In addition, buildings represent more than 50% of the nation's wealth. The design, construction and maintenance of buildings have a tremendous impact on people and nature. Structures also impact areas beyond their immediate location, affecting the watersheds, air quality, and transportation patterns of communities. Buildings consume or are responsible for:

- 40% of the world's total energy use
- 25% of timber harvest
- 16% of fresh water withdrawal
- 50% of ozone-depleting CFCs still in use
- 30% of raw materials consumption
- 35% of global CO_2 emissions
- 40% of municipal solid waste destined for local landfills

BENEFITS OF SUSTAINABLE BUILDING

Reduce operating costs.

Energy Efficiency

- Climate-sensitive design and energy technology use can cut heating and cooling energy consumption by 60 percent and lighting energy requirements by 50% in U.S. buildings.
- Returns on investment for energy-efficiency measures can be higher than rates of return on conventional and even high-yield investments.
- Widespread participation in the U.S. EPA's Green Lights program could save over 65 million kilowatts of electricity, and reduce the nation's electric bill by $16 billion annually.

Water Efficiency

- Water-efficient appliances and fixtures, behavioral changes, and changes in irrigation methods can reduce consumption by up to 30% or more.
- A typical 100,000 square foot office building can yield annual savings of $4,393 by installing high efficiency measures and reducing water consumption by 30%.

Waste Reduction

- Construction and demolition waste equals from 35% to 40% of Municipal Solid Waste.
- Construction and demolition waste recycling can result in significant savings of not only landfill space but also waste hauling and tipping fees. The Portland Trailblazers Rose Garden arena construction/demolition project saved an estimated $186,000 through waste diversion and recycling.
- Recycling creates jobs. Diverting these materials to local processors instead of local landfills creates new economic opportunities.[3]

Reduce some first costs.

- Rehabilitating an existing building can lower infrastructure and materials costs.
- Integrated design can use the payback from some strategies to pay for others.
- Energy efficient buildings can reduce their equipment needs -- downsizing some equipment, such as chillers, or eliminating equipment, such as perimeter heating.
- Using pervious paving and other runoff prevention strategies can reduce the size and cost of stormwater management structures.

Expand timeframe to create return on investment.

- Life Cycle Cost Analysis looks at the net present value of design options as investments. The goal is to achieve the highest, most cost-effective environmental performance possible over the life of the project.
- Within a building's total life span, initial building costs account for approximately 2% of total life cycle costs, while operations and maintenance costs account for 6%, and *personnel costs account for 92%*.
- Many green building measures make good long-term economic sense if the first cost is subtracted from all future savings, and savings are calculated with market capitalization rates. In other words, these measures can be thought of as investments that gain value over time, over and above investments at market interest rates.
- Low up-front expenditures can often result in much higher costs over the life of a building.

[3] Institute for Local Self Reliance (http://www.ilsr.org/)

BENEFITS OF SUSTAINABLE BUILDING (Continued)

Help protect endangered salmon.

The Governor's draft Salmon Recovery Plan spells out seven specific areas of human activity that threaten salmon. Four of these areas - *land use decisions, storm water management, water use,* and *water pollution* are directly impacted by building and development. Sustainable building techniques that address these and other areas include:

- ❑ Preserve existing vegetation and cluster development to preserve streamside habitat.
- ❑ Minimize impervious surfaces to decrease flooding and protect base stream flows.
- ❑ Install water efficient building systems to protect area water supplies and habitat areas.
- ❑ Amend degraded soils with compost to detain stormwater runoff and reduce plants' water needs. See the Soils for Salmon Web site at http://dnr.metrokc.gov/swd/ResRecy/soil4salmon.htm
- ❑ Design and maintain landscapes to be salmon friendly. See the Salmon Friendly Gardening web site: http://www.cityofseattle.net/util/RESCONS/plantNaturally/salmonfriendly.htm
- ❑ Use low toxic building materials that reduce water pollution during manufacturing and installation*.
- ❑ Minimize energy consumption and provide renewable on-site power generation in order to reduce demand for hydropower.
- ❑ Use sustainably certified lumber from the Pacific Northwest region.

** Note: With the support of the Bullitt Foundation, Seattle Public Utilities and City Light are participating with the Center for Maximum Potential Building Systems to conduct research on the links between salmon recovery and building materials manufacture and use. Results will help in selecting materials for projects that minimize adverse impact on our threatened salmon species.*

Improve Productivity and Human Health.

- ❑ Improved indoor environments[4] can increase employee productivity by up to 16%.
- ❑ Employees in buildings with healthy interiors have less absenteeism and longer retention.
- ❑ The US Environmental Protection Agency ranks indoor air pollution among the top five environmental risks to public health. One third of all buildings have poor indoor air quality.
- ❑ Sick Building Syndrome and Building Related Illness are estimated to cost $60 billion per year in medical expenses and lost worker productivity in the U.S.
- ❑ Benefits to tenants of green buildings with good overall environmental quality include reduced absenteeism, better employee morale, and community recognition.
- ❑ Ensuring healthy indoor air can reduce insurance and operating costs and reduce liability risks. The U.S. EPA faced a lawsuit from employees who became ill after new carpet was installed during a renovation. The employees won the lawsuit, worth approximately $1 million.

*See Seattle City Light's **Sustainable Demand Project** for more information on the human factors benefits of sustainable building. Visit the Web site at:* http://www.cityofseattle.net/light/conserve/sustainability/

Provide Community Benefits.

Sustainable building can help to support and or protect:

- ❑ The local economy through demand for local building materials, jobs and industries
- ❑ Area environmental quality such as clean air and water
- ❑ Longevity of public infrastructure, such as power plants, landfills, and water treatment plants
- ❑ Social equity through the inclusion of community groups and special populations in design process
- ❑ Global climate change mitigation by lowering energy and material consumption in building construction and operation, which can contribute to climate change.

[4] Good indoor overall environmental quality includes effective ventilation, natural or proper levels of lighting, good indoor air quality and acoustics.

Seattle's Sustainable Building Policy

WHY THE LEED RATING SYSTEM™?

The City of Seattle's Sustainable Building policy is tied to a green building rating system known as LEED™, developed by the US Green Building Council (USGBC). The USGBC was formed in 1993 to "accelerate the adoption of green building practices, technologies, policies, and standards." Their philosophy: the resources required in building, operating, and replenishing the current level of infrastructure is enormous, yet resources available for such activity are diminishing. To remain competitive and to continue to expand and produce profits in the future, the building industry must address the economic and environmental consequences of its actions. Council membership consists of more than 500 organizations including: product manufacturers; environmental leaders such as the Natural Resources Defense Council and the Audubon Society; building and design professionals and associations such as the American Institute of Architects; and retailers and building owners. The City of Seattle joined the USGBC in 1999.

The USGBC developed the Leadership in Energy and Environmental Design™ (LEED™) rating system to promote market transformation. LEED™ is a self-certifying system designed for rating new and existing commercial, institutional, and high-rise residential buildings. Different levels of green building certification are awarded based on the total credits earned in each of several categories: site, energy, material resources, indoor environmental quality and water. The system is designed to be comprehensive in scope, yet simple in operation. Use of a national standard helps to establish minimum performance levels, creates a common dialogue for discussion, and allows Seattle to measure its sustainable building performance relative to other jurisdictions using LEED™. In addition, technical rulings, training, networking and marketing support are provided by the USGBC. In 2000, a regional chapter of the USGBC, the Cascadia Chapter, was formed. The regional chapter includes Washington, Idaho, Montana, and Oregon. Chapter members support the activities of the USGBC and the implementation of LEED™ as a market transformation tool.

The Seattle Sustainable Building Policy states:

> *It shall be the policy of the City of Seattle to finance, plan, design, construct, manage, renovate, maintain, and decommission its facilities and buildings to be sustainable. This applies to new construction and major remodels in which the total project square footage meets the criteria given. The US Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system and accompanying Reference Guide shall be used as a design and measurement tool to determine what constitutes sustainable building by national standards. All facilities and buildings over 5,000 gross square feet of occupied space shall meet a minimum LEED Silver rating.*

Desired performance:

Since the adoption of the City's Sustainable Building Policy in February 2000, the USGBC has modified the definition of a "Silver" rating for LEED™, from 39-45 points (60-69%) to 33-38 points (50-59%) out of 65 possible core points. The intent of the Policy is a certain performance level for City buildings, using LEED™ as the yardstick. For the purposes of City Policy, it is assumed that the performance level minimum is still Silver. Project managers and design teams are encouraged to go beyond this level.

The project target of occupied space was chosen to focus on projects in which the human benefits of building sustainably could be realized. In addition, the LEED™ rating system was developed for application to commercial, institutional, and high rise residential projects. The City of Seattle constructs many projects that do not meet the given criteria. These projects include buildings or remodels smaller than 5000 square feet, unoccupied buildings, and parks, roadways, and other infrastructure. Project managers and design teams are encouraged to apply the portions of the LEED™ rating system which make sense for their project, and to seek out other project goals that increase the environmental, social, and economic benefits of the project.

Seattle's Sustainable Building Policy

LEED RATING SYSTEM™ SEATTLE CIP SUPPLEMENTS

The purpose of the Seattle Supplements to LEED™ is to provide assistance in applying LEED™ to City CIP projects, and integration of the LEED™ system with local building codes, practices, and City policies. In addition, resource information is provided to connect City capital project managers with program staff and information. The Seattle Supplements will be updated as additional resources are identified. Please feel free to provide feedback or suggestions regarding changes or additions to the CIP Supplements. Please call Thor Peterson, Seattle Public Utilities Sustainable Building Program, with any comments or questions: (206) 615-0731 or thor.peterson@ci.seattle.wa.us.

A few minor modifications to the LEED™ system are required for use with City projects. These are noted in these Supplements. The additional requirements are:

- All projects shall comply with the **City Landscape and Grounds Management Guidelines**.
- All projects shall achieve a **minimum of two credits** in the Energy section from Energy Credit 1.

In addition, there are several other City policies and programs that relate to sustainable building, included for your reference. These are:

- The City's Resolution regarding use of sustainably certified wood (Resolution 30015),
- The City's Policy regarding purchasing of recycled content materials (SMC section 3.18.904), and
- The Copernicus Project, the City's plan to redesign the way goods and services are procured (see a description of Copernicus in the Appendices to this document).

Seattle's Sustainable Building Policy

CITY OF SEATTLE GREEN BUILDING TEAM

Many thanks go to the members of the City of Seattle Green Building Team, who have provided countless hours of dedicated support to the goal of increasing the sustainability of City Capital Facilities. The policy and the LEED™ Seattle CIP Supplements were prepared by members of the Green Building Team.

For assistance with CIP projects in your department, please contact your department's Green Building Team representative.

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Sustainable Sites: Seattle CIP Supplement

Seattle has a unique and sensitive regional ecology. Large scale planning issues such as transportation, as well as the characteristics of each individual site, must be considered for sustainable landscape development to occur. Landscape and construction activities can have far-reaching impacts on water supply and quality, air quality, and habitat preservation. With the recent listing of the Chinook salmon as threatened, many site-related construction issues are of even greater importance in our area. The City of Seattle has numerous programs that support the sustainable human use of landscapes: **Natural Lawn Care**, **Grasscycling**, **Salmon Friendly Gardening**, **Soils for Salmon**, and the **Water Efficient Irrigation Program** (see http://www.cityofseattle.net/util/rescons).

Landscape related issues have come to the forefront in the recent past with the Cedar River Habitat Conservation Plan (HCP) and the Mayor's Millennium Legacy Projects. The purpose of the HCP is to protect and restore all species of concern that may be affected by the operations of Seattle Public Utilities and City Light in the Cedar River Watershed, while allowing the City to continue to provide high quality drinking water to the region. The HCP is designed to provide significant benefits to 83 species of fish and wildlife found throughout the Cedar River system.

The Urban Creeks Legacy has several themes: reconnect citizens to their urban watersheds, restore natural creek habitat, celebrate these natural resources, and sustain already realized benefits and gains. With the Millennium Woods Legacy, Seattle planted 20,000 new trees through public/private partnerships. New trees will help reverse the trend of native invasion in our urban open spaces, improve air quality, reduce storm runoff and erosion and help cleanse waters headed to urban creeks, and restore vital habitat.

The City's new pesticide strategy aims to eliminate the use of the most hazardous herbicides and insecticides by June 2000 and reduce overall pesticide use 30% by December 2002. Seattle Public Libraries is furthering this effort with by collaborating with Seattle Public Utilities in a model Natural Lawn Care program.

Amending urban soils with compost can significantly improve detention/infiltration and reduce storm runoff from landscaped areas, lessening strains on stormwater management infrastructure and mitigating damage to urban creek habitat. Compost-amended soils also capture, filter, and break down a variety of urban pollutants, and reduce the need for pesticides and synthetic fertilizers. Finally, compost reduces summer irrigation needs, leaving more water in our rivers for fish.

OVERVIEW OF THE SEATTLE-SPECIFIC PREREQUISITES AND CREDITS FOR SUSTAINABLE SITES

- ❑ In addition to the LEED™ requirements, it is **required** that all projects comply with the **City Landscape and Grounds Management Guidelines**. A full copy of the guidelines is available at http://www.cityofseattle.net/environment/Documents/landscape.pdf or from Thor Peterson at Seattle Public Utilities (615-0731or thor.peterson@ci.seattle.wa.us).

Sustainable Sites: Seattle CIP Supplement

Site Prerequisite: Erosion and Sedimentation Control

1 point

LEED™ v2.0 Prerequisite Requirement:

Design to a site sediment and erosion control plan that conforms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document NO. EPA 833-R-92-001, Chapter 3, OR local Erosion and Sedimentation Control standards and codes, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.

Seattle Public Utilities and the Department of Design, Construction and Land Use are in the process of creating a document comparing the practices in the referenced EPA document with DCLU's Construction Stormwater Control Director's Rule. Preliminary examination shows local code to be more stringent than the referenced standard. The final comparison will be included in the Appendices to these Supplements and accessible on http://www.cityofseattle.net/sustainablebuilding when it becomes available.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ Stormwater, Grading, and Drainage Control Code, and Construction Stormwater Control Director's Rule: http://www.cityofseattle.net/dclu/codes/Dr/ddr2000-16.pdf (note: this is a 5.7mb document!). For the new Stormwater Code, see the City Clerk's Web site: http://clerk.ci.seattle.wa.us and search the Legislative Database for Ordinance #119965 or by "Stormwater" as the key word.
- ❑ Seattle Engineering Department Director's Rule 93-3: Criteria for Drainage Control Discharge Point, Discharge Rate, Design Method for Detention Standard Drainage Control Plans, additional requirements.
- ❑ Water Quality-Related Ecology Regulations: http://www.wa.gov/ecology/pubs/96503/chapt2.htm includes information on construction site stormwater management, vehicle cleaning, cement-mixing related guidelines.
- ❑ Refer to soil preservation/restoration guidelines as described under Credit 5, below.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ Department of Ecology's Revised *Stormwater Manual* (2000) http://www.wa.gov/ecology/biblio/wq.html
- ❑ *Surface Water Design Manual* King County Department of Natural Resources (Seattle, WA 1998) See the King County site for ordering information, downloadable drawings, and supporting documents: http://dnr.metrokc.gov/wlr/dss/MANUAL.HTM
- ❑ *Wetlands and Urbanization Implications for the Future* Final Report of the Puget Sound Wetlands and Stormwater Management Research Program 1997: http://splash.metrokc.gov/wlr/basins/weturban.htm
- ❑ King County *Stormwater Pollution Control Manual: Best Management Practices for Businesses*: http://dnr.metrokc.gov/wlr/dss/spcm.htm
- ❑ *Waste Disposal and Erosion/Sediment Control Methods* (1988). An AGC Water Quality Manual. Available through Associated General Contractors of Washington 1200 Westlake Avenue N, Suite 301, Seattle, Washington 98109 (800/562-2868)

STAFF ASSISTANCE

- ❑ DCLU Service Desk numbers: Site Development Desk: 233-7232 or Drainage Review Desk: 684-5362

Sustainable Sites: Seattle CIP Supplement

Site Credit 1:
Site Selection

1 point

LEED™ v2.0 Credit Requirement:

Do not develop buildings on portions of sites that meet any one of the following criteria:

- Prime agricultural land as defined by the Farmland Trust
- Land whose elevation is lower than 5 feet above the elevation of the 100-year flood as defined by FEMA
- Land that provides habitat for any species on the Federal or State threatened or endangered list
- Within 100 feet of any wetland as defined by 40 CFR, Parts 230-233 and part 22, OR as defined by local or state rule or law, whichever is more stringent.
- Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public land owner (Park Authority projects are exempt).

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ SMC 25.09: "Regulations for Environmentally Critical Areas." See the Municipal Code (http://clerk.cityofseattle.net/~public/code1.htm) for the entire text.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ See the Salmon Information Center's Web site for information on threatened salmon: http://www.salmoninfo.org/esainfo.htm, or call 1-877-SALMON-9

Site Credit 2:
Urban Redevelopment

1 point

LEED™ v2.0 Credit Requirement:

- Increase localized density to conform to existing or desired density goals by utilizing sites that are located within an existing minimum development density of 60,000 square feet per acre (2 story downtown development).

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ **Open Space.** SMC 23.12.105 Open space policies, especially Policy 2: "Major Public Projects" and Policy 3: "Open Space Target Areas." The Municipal Code is available online at http://clerk.cityofseattle.net/~public/code1.htm

Site Credit 3:
Brownfield Redevelopment

1 point

LEED™ v2.0 Credit Requirement:

- Develop on a site classified as a brownfield and provide remediation as required by EPA's Brownfield Redevelopment program requirements.

ADDITIONAL RESOURCES AND ASSISTANCE:

Regional Brownfields Program information:

- ❑ http://epainotes1.rtpnc.epa.gov:7777/r10/cleanup.nsf/webpage/Brownfields EPA Region 10 site includes a Brownfields Resource Guide for Washington State.

Site-specific remediation information: call the Dept. of Ecology's Northwest Regional Office (425-649-7000).

- ❑ Grants for local governments from the Local Toxics Control Account for cleanup of contaminated sites (including Brownfields) are available through the Department of Ecology. Contact Steve Loftness (360-407-6060) or stlo461@ecy.wa.gov

- ❑ Projects can receive up to $200,000 through a competitive funding process for site cleanups that use innovative processes for remediation. See EPA's site: http://www.epa.gov/swerosps/bf/pilot.htm or contact Lori Cohen at EPA Region 10 Seattle office (553-5623 or 1-800-424-4EPA).

Sustainable Sites: Seattle CIP Supplement

Site Credit 4: Alternative Transportation

1-4 points

LEED™ v2.0 Credit Requirement:

- Locate building within 1/2 mile of a commuter rail, light rail, or subway station or 1/4 mile of 2 or more bus lines (**1 point**).
- Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for 5% or more of building occupants (**1 point**).
- Install alternative-fuel refueling station(s) for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors (**1 point**).
- Size parking capacity not to exceed minimum local zoning requirements AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants, OR, add no new parking for rehabilitation projects AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants (**1 point**).

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ Preferred parking for carpools; Seattle Municipal Code (**SMC 23.12.070**) provides for a "Substitution of Alternative Transportation for a Portion of the Minimum Parking Requirement (See text of code online - http://clerk.ci.seattle.wa.us/~public/code1.htm).
- ❑ **Alternative fuels**. DOE currently recognizes the following as alternative fuels: methanol and denatured ethanol, natural gas, liquefied petroleum gas, hydrogen, coal-derived liquid fuels, fuels derived from biological materials, and electricity. See resources, below.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ See the City's *Car Smart Communities* web site for Seattle-specific information on transportation issues and solutions: http://www.cityofseattle.net/carsmart/
- ❑ **Rail station information**: See a map of the Sound Transit Central Link through Seattle at http://www.soundtransit.org/maps/linkroute.htm
- ❑ **Busline information**: METRO website listing Seattle bus routes and stops http://transit.metrokc.gov/bus/area_maps/seattle.html
- ❑ SEATRAN has the **Bicycle Spot Improvement Program**, installing bike racks in public places: http://cityofseattle.net/td/bikerack.asp (684-7583)
- ❑ http://transit.metrokc.gov/bike/lockers.html has information on bike racks and lockers supplied by METRO through the **Employer Bicycle Parking Program** (providing matching grants to employers providing bicycle parking facilities to employees).
- ❑ King County **Site Transportation Facilities Enhancement** (STEP). King County matching grants funds available for on-site lockers/showers, bus shelters/pullouts, bike/pedestrian trails, security lighting/signage, information kiosks. See the Web site: http://transit.metrokc.gov/programs_info/employer/empcommute.html
- ❑ Alternative Fuels Data Center, including maps of existing refueling stations and instructions for how to submit your station to be included on the map. http://www.afdc.doe.gov/refueling.html. Also call the National Alternative Fuels Hotline: 800-423-1363.
- ❑ Energy Efficiency and Renewable Energy Network (EREN) Seattle Regional Office http://www.eren.doe.gov/sro/

Sustainable Sites: Seattle CIP Supplement

Site Credit 5: Reduced Site Disturbance

1-2 points

LEED™ v2.0 Credit Requirement:

- On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond pervious paving areas that require additional staging areas in order to limit compaction in the paved area; OR, on previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation (**1 point**).
- Reduce the development footprint (including building, access roads, and parking) to exceed the local zoning's open space requirement for the site by 25% (**1 point**).

Preserving and restoring native soil conditions helps reduce storm runoff, filter pollutants, reduce irrigation needs, and greatly improves plant survival and vigor. See the Soils for Salmon Web site: http://www.metrokc.gov/dnr/swd/resRecy/soil4salmon.htm. For guidelines on amending and restoring soils with compost see "Guidance for Landscaping with Compost Amended Soils" : http://depts.washington.edu/cuwrm/pub.htm

SUMMARY OF CITY OF SEATTLE STANDARDS:

- **Landscaping.** Client Assistance Memo (CAM#234) on landscaping. Includes a small section on the potential value of tree preservation. Also Director's Rule 13-92: Landscape Standards for Compliance with Land Use Code and SEPA Requirements.

ADDITIONAL RESOURCES AND ASSISTANCE:

- Trees in Seattle's planting strips: call the City Arborist (684-5047)

Seattle Public Utilities

- Natural Landscaping http://www.cityofseattle.net/util/rescons/plantNaturally/default.htm
- Salmon Friendly Gardening http://www.cityofseattle.net/util/rescons/plantNaturally/SalmonFriendy.htm

Site Credit 6: Stormwater Management

1-2 points

LEED™ v2.0 Credit Requirement:
Implement a stormwater management plan that results in:

- No net increase in the rate or quantity of stormwater runoff from existing to developed conditions; OR, if existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff (**1 point**).
- Treatment systems designed to remove 80% of the average annual post development total suspended solids (TSS), and 40% of the average annual post development total phosphorus (TP), by implementing Best Management Practices (BMPs) outlined in EPA's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (EPA 840-B-92-002 1/93) (**1 point**).

SUMMARY OF CITY OF SEATTLE STANDARDS:

- The full text of the Seattle Stormwater, Grading and Drainage Control Code and Director's Rules are online: http://www.cityofseattle.net/dclu/Codes/sgdccode.htm

ADDITIONAL RESOURCES AND ASSISTANCE:

- See the Site Prerequisite, "Erosion and Sedimentation Control," above.
- DCLU Service Desk numbers: Site Development Desk: 233-7232 or Drainage Review Desk: 684-5362
- SPU Surface Water Quality web page http://www.cityofseattle.net/util/rescons/swq/
- Compost amended soils reduce stormwater runoff. For guidelines on amending and restoring soils with compost see "Guidance for Landscaping with Compost Amended Soils" http://depts.washington.edu/cuwrm/pub.htm.
- Pervious paving: go to http://depts.washington.edu/cuwrm select "Publications" and click on "Permeable Pavement Demonstration Project."

Sustainable Sites: Seattle CIP Supplement

Site Credit 7: Landscape and Exterior Design to Reduce Heat Islands

1-2 points

LEED™ v2.0 Credit Requirement:

- Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, including parking lots, walkways, plazas, etc., OR, use light-colored, high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces, OR place a minimum of 50% of parking space underground OR use open-grid pavement system (net imperviousness of LESS than 50% of a minimum of 50% of the parking lot area (**1 point**).
- Use ENERGY STAR Roof compliant, high-reflectance AND low-emissivity roofing (initial reflectance of at least .65 and three year aged reflectance of at least .5 when tested in accordance with ASTM E408) for a minimum of 75% of the roof surface; OR, install a "green" (vegetated) roof for at least 50% of the roof area (**1 point**).

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ DCLU Director's Rule #13-92: Landscape Standards for Compliance with Land Use Code and SEPA Requirements (not available online). Call the DCLU Publications desk: 233-3881.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ For shade/tree canopy, review *A City Among The Trees*, a video and workbook produced by the City of Seattle Urban Forest Coalition and Arai/Jackson Architects. Contact Liz Ellis, SEATRAN, for a copy (684-5008 or liz.ellis@ci.seattle.wa.us).
- ❑ City Arborist: 684-7649
- ❑ TREEmendous Seattle http://www.seattletrees.org
- ❑ For information on local "green roofs" projects see the Northwest Ecobuilding Guild site http://www.ecobuilding.org/seattle/ecoroof.htm

Site Credit 8: Light Pollution Reduction

1 point

LEED™ v2.0 Credit Requirement:

- Do not exceed Illuminating Engineering Society of North America (IESNA) foot-candle level requirements as stated in the Recommended Practice Manual: Lighting for Exterior Environments, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ See Seattle Municipal Code 23.12.070 "Commercial Area Land Use Policies," Policy 14: Light and Glare Control for commercial area structures. The Municipal Code is available online at: http://clerk.cityofseattle.net/~public/code1.htm
- ❑ See also SMC 25.05.675 "Specific environmental policies." Section K addresses Light and Glare, and the mitigating measures that can be required.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ Consult the Lighting Design Lab for strategies aimed at reducing light pollution. Find out more about the Lab: http://www.cityofseattle.net/light/conserve/cv4_ldl.htm, or call 329-9532.
- ❑ The City's Sustainable Building Library has a reference copy of the *IESNA Manual*. See http://www.cityofseattle.net/sustainablebuilding.

Sustainable Sites: Seattle CIP Supplement

ADDITIONAL RESOURCES AND ASSISTANCE FOR PLANNING SUSTAINABLE SITES

Seattle Public Utilities:

- Natural Lawn Care Homepage http://www.cityofseattle.net/util/rescons/n_home1.htm
- Urban Creeks Legacy Project http://www.cityofseattle.net/util/urbancreeks/

Office of Sustainability and Environment:

- City Landscape and Grounds Management Guidelines http://www.cityofseattle.net/environment/Documents/landscape.pdf
- City of Seattle Pesticide Strategy http://www.cityofseattle.net/environment/Pesticides.htm (Includes Chemical Use Policy, Alternative Pest Control Practices for City of Seattle Grounds Managers, Pesticide Tier Tables)

Seattle Transportation:

- Street Tree Planting Procedures http://www.cityofseattle.net/td/treeplant.asp

Sustainable Sites: Seattle CIP Supplement

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Water Efficiency: Seattle CIP Supplement

Seattle has been highly effective in reducing per capita use of water over the last ten years, achieving demand reductions of approximately 1.5% annually. Through targeted educational outreach and successful water conservation programs directed at both residential and commercial sectors, customers have responded by the integration of water conservation practices, implementation of water efficient technology, and the adoption of a conservation ethic.

According to Seattle Public Utilities' *Water Conservation Potential Assessment*, current conservation efforts in conjunction with added water supply from the Tolt Filtration Project will meet projected demand through 2013, after which new sources and/or conservation actions will be needed. The City has been actively pursuing conservation measures internally, including water conservation. The Energy and Water Conservation section of the City's Environmental Policy directs CIP managers to ensure that "facilities and landscapes… are designed, constructed, and commissioned to be state-of-the-art water and energy efficient based on a life cycle cost analysis," (Environmental Policy Manual, section 6.11). Active water conservation programs are directed at business, industrial, institutional and residential customers of Seattle Public Utilities. These are now being integrated and further refined under the umbrella of 1% Water Conservation, to help achieve the goal of a 1% incremental decrease in water demand annually over the next decade, to ensure the availability of adequate water for people, business, and our threatened Northwest species.

City CIP projects can act as examples of conservation to the Seattle community and simultaneously reduce operations costs. The following guidelines will encourage more advanced water conservation practices and technologies in City-owned facilities and help move the City of Seattle into a position of leadership and innovation in environmental stewardship.

In addition to LEED™ requirements, any building constructed in Seattle must comply with the Uniform Plumbing Code - Water Conservation Performance Standards.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- Washington State Building Code, chapter 51-26, "Uniform Plumbing Code -Water Conservation Performance Standards."
- See also WAC 51-46-0402: "Water Conserving Fixtures and Fittings." It can be accessed online through the Washington State Building Code Council's Web site: http://www.ocd.wa.gov/info/hsg/bc/sbccindx.html

RESOURCES AND ASSISTANCE:

- Uniform Plumbing Code questions should be directed to the King County Health Department (233-2621).

Water Efficiency: Seattle CIP Supplement

Water Credit 1:
Water Efficient Landscaping

1-2 points

LEED™ v2.0 Credit Requirement:

- Use high efficiency irrigation technology, OR, use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means (**1 point**).
- Use only captured rain or recycled site water for an additional 50% reduction (100% total reduction) of potable water for site irrigation needs, OR, do not install permanent landscape irrigation systems (**1 point**).

ADDITIONAL SEATTLE CIP RECOMMENDATION:

- ❑ Although not required, it is **highly recommended** that projects consider the installation of submeters for landscaping. Projects that follow this recommendation will be eligible to apply for innovation credits. Facilities that have exterior landscaping features requiring supplemental water will have the irrigation system separately submetered according to requirements established by Seattle Public Utilities (SPU) in the "Submeter Inventory Form" (see Resources and Assistance, below).

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ Incentive dollars may be available from Seattle Public Utilities for irrigation technologies with proven water savings. Contact Jenna Smith at SPU's Water Efficient Irrigation Program (684-5955 or jenna.smith@ci.seattle.wa.us)
- ❑ See the Sustainable Sites section of these Supplements for water efficient landscaping information and technical help.

Water Credit 2:
Innovative Wastewater Technologies

1 point

LEED™ v2.0 Credit Requirement:

- Reduce the use of municipally provided potable water demand for building sewage conveyance by a minimum of 50%, OR, treat 100% of wastewater on site to tertiary standards.

ADDITIONAL RESOURCES AND ASSISTANCE:

Wastewater Reduction:

- ❑ Rebates and technical information are available for water conserving restroom fixtures and laundry equipment through Seattle Public Utilities to its commercial customers. Call 684-SAVE, or see the 1% Water Conservation Web site: http://www.ci.seattle.wa.us/util/onepercent/commerical.htm

Onsite wastewater treatment:

- ❑ National Small Flows Clearinghouse: http://estd.wvu.edu/nsfc/

Water Efficiency: Seattle CIP Supplement

Water Credit 3:
Water Use Reduction

1-2 points

LEED™ v2.0 Credit Requirement:

- Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements (**1 point**).
- Exceed the potable water use reduction by an additional 10% (30% total efficiency increase) (**1 point**).

ADDITIONAL SEATTLE CIP RECOMMENDATION:

- ❑ Although not required, it is **highly recommended** that projects consider the **installation of submeters** in the following situations. Projects that follow this recommendation will be eligible to apply for innovation credits.

1. **City Tenant Submetering:** Facilities with tenant spaces to be occupied by other than City departments will have each tenant space individually metered and will have developed an active water management plan to utilize metering information for efficiency objectives. See Water Credit 1, above, for information and contacts related to submetering.
2. **Cooling Tower Metering, Water Efficiency, and Component Specification:** if a customer meters make-up water to a cooling tower, they can set up an account to have the meter read by SPU and qualify for a sewer charge deduction for the amount of water recorded through the water meter. This provides some information to the customer in the form of total water use by the cooling tower, but does not provide any help in determining water efficiency.
   - Installing a make-up meter recording total water feeding into the cooling tower and a bleed-off meter recording total water discharged to the sewer are recommended. Both must be electronic meters capable of interfacing with an energy management system. This will provide the opportunity for daily readings and water efficiency performance.
   - With the quality of SPU water, cooling towers can be operated at 5 cycles of concentration with no chemical treatment necessary. This should be considered baseline and can be easily determined through a calculation using the make-up and bleed-off water meter numbers.
   - Specify stainless steel pan sections to increase the longevity of the basin section in any new cooling tower.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ Rebates and technical assistance are available from Seattle Public Utilities for qualifying water-conserving fixtures and technologies: http://www.ci.seattle.wa.us/util/onepercent/commerical.htm

Water Efficiency: Seattle CIP Supplement

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Energy and Atmosphere: Seattle CIP Supplement

Seattle has a long history of progressive programs to achieve energy efficiency in buildings. The Washington State Energy Code with Seattle amendments provides a higher baseline than the LEED™ v2.0 baseline for energy efficiency. To ensure that projects designated as Green Buildings in Seattle are more energy efficient than the code minimum, **projects are required to earn credits in this section**.

Local resources exist to increase energy efficiency in buildings. City Light's energy conservation programs provide strong incentives and expert advice (see http://www.cityofseattle.net/light/conserve/), from commissioning to high performance new construction and retrofits. The Lighting Design Lab can evaluate your lighting scheme and suggest energy efficient, occupant-friendly options. The DCLU has a series of energy related Client Assistance Memos (http://www2.cityofseattle.net/dclu/codes/dr/camlist.asp) to assist projects – including information on determining sun exposure and energy efficient lighting equipment. Specific programs for energy efficiency offered by City Light and the Lighting Design Lab will be referenced throughout this section, but they can also be consulted for issues not captured by the credits contained here.

This Supplement provides users with specific guidance in achieving the level of energy efficiency necessary to earn the credits required. It also recognizes the long-term benefits of comprehensive building commissioning programs and performance measurement and verification plans. Implementing building commissioning and performance measurement and verification plans will ensure energy efficiency gains are sustained throughout a building's lifetime.

OVERVIEW OF SEATTLE-SPECIFIC PREREQUISITES AND CREDITS:

- ❑ All City projects shall achieve a minimum of **two credits** in this section from Energy Credit 1: Optimize Energy Performance.

RESOURCES AND ASSISTANCE:
A number of resources are available to assist you with Energy Code requirements and how to maximize energy efficiency. Following is a short list of these resources:

- ❑ For the language of the Washington State Energy Code with Seattle Amendments, as well as links to Seattle Department of Design, Construction and Land Use (DCLU) Client Assistance Memos (CAMs), and other helpful links, see the Seattle Energy Code Web site at: http://www.cityofseattle.net/dclu/energy
- ❑ Seattle City Light also offers information, incentives and assistance to building owners and project managers within City Light's service area interested in a variety of energy management services: http://www.cityofseattle.net/light/conserve
- ❑ The Lighting Design Lab offers a host of free and low cost seminars to learn more about energy efficient and human-friendly lighting design. See the Lighting Design Lab's Web site at: http://www.northwestlighting.com

Energy and Atmosphere: Seattle CIP Supplement

Energy Prerequisite 1: Fundamental Building Systems Commissioning

Additional Seattle CIP Requirement; see below

LEED™ v2.0 Prerequisite Requirement:

Implement all of the following fundamental best practice commissioning procedures:

- Engage a commissioning authority.
- Develop design intent and basis of design documentation.
- Include commissioning requirements in the construction documents.
- Develop and utilize a commissioning plan.
- Verify installation, functional performance, training and documentation.
- Complete a commissioning report.

The LEED™ Commissioning Prerequisite is generally more comprehensive than the Seattle Amendments to the Washington State Energy Code's completion and commissioning requirements. However, the Seattle Amendments to the Washington State Energy Code contain requirements that may not be specifically addressed by the commissioning information referenced in the LEED™ Reference Guide. The LEED™ reference documents should enable the user to meet Seattle's Energy Code requirements without much additional effort. For the sake of clarity and to facilitate code compliance, Seattle's requirements are referenced below.

Seattle CIP Supplement Prerequisite Requirement:

- ❑ In addition to the LEED™ commissioning requirements, **all projects shall comply with the Seattle Amendments to the Washington State Energy Code**, which provides requirements for building completion and commissioning (see references below). **Seattle completion and commissioning requirements apply to all nonresidential structures, regardless of size,** and apply only to **new mechanical/HVAC systems** and **lighting installations that include automatic shut-off, daylight, or occupant sensing controls; occupancy sensors; or automatic time switches**.

DOCUMENTATION:

- ❑ LEED™ v2.0 spells out the procedures necessary to earn this credit. The City recognizes there are several steps to implementing a building commission plan that may take a year or more to complete. Project managers may consider projects to ***preliminarily meet*** Energy Prerequisite 1 for building commissioning upon **completion of a commissioning plan** in the design phase that details the commissioning process, including testing specifications for inclusion in the construction documents, and roles and responsibilities of team members.
- ❑ Project managers may consider Prerequisite 1 ***fulfilled*** with receipt of the **final commissioning report** confirming that the design intent has been achieved.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ Seattle Energy Code: Section 1416 Completion (and Commissioning) Requirements (for building mechanical systems) and Section 1513.7 Commissioning Requirements (for lighting controls)

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ DCLU Client Assistance Memo (CAM 419) Commissioning: Mechanical and Lighting Systems http://www.ci.seattle.wa.us/dclu/Publications/cam/cam419.pdf
- ❑ Seattle City Light offers assistance and incentives for commissioning services, and offers a handbook on commissioning. Call 684-3274, or visit http://www.cityofseattle.net/light/conserve/business/bdgcoma/cv5_bca.htm
- ❑ Building Commissioning Association-Northwest: http://www.bcxa.org/
- ❑ Washington State Department of General Administration (GA): Commissioning Guidelines – Instructions for A/Es working with GA's A&ES Division, available in the Appendices to these Supplements.

Energy and Atmosphere: Seattle CIP Supplement

Energy Prerequisite 2: Minimum Energy Performance

Additional Seattle CIP Requirement; see below

LEED™ v2.0 Prerequisite Requirement:

- Design to meet building energy efficiency and performance as required by ASHRAE/IESNA 90.1-1999 or the local energy code, which ever is the more stringent. Analyze expected baseline building performance using the System/Component Method.

Seattle CIP Supplement Prerequisite Requirement:
All projects shall comply with the 1997 Washington State Energy Code with Seattle Amendments.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ASHRAE Standard 90.1 User's Manual: The nonresidential portion of the Washington State Energy Code and Seattle Amendments are based on ASHRAE/IESNA Standard 90.1-1989, but also include some requirements from public review drafts of ASHRAE/IESNA Standard 90.1-1999. Thus the ASHRAE User's Manuals for Standards 90.1-1989 and 90.1-1999 are useful tools to aid in interpreting Energy Code requirements. However, users should be aware that there are requirements in the Washington State Energy Code and Seattle Amendments that are more stringent than those found in Standard 90.1. In such cases, the user should consult with the DCLU Energy Code Technical Backup. For a comparison of the two, see Appendix H: LEED ENERGY BASELINE FOR SEATTLE PROJECTS: A Comparison of *ASHRAE/IESNA Standard 90.1-1999* and the *1997 Seattle Energy Code* (Revised version: 2 February 2001).
- Technical Backup: The best source for Energy Code information is the code itself, followed by Client Assistance Memos, which address more common questions. In addition, DCLU provides a **technical backup** service to answer Energy Code questions, which is available by calling **684-7846 between 1:00 and 4:15 p.m.** Prepare your question, call this number, and then ask for "Energy Technical Backup". (This number can also be used for questions on the Mechanical Code. So that DCLU can give you a more precise answer, please provide as complete a summary of your project and the particular question as possible. Be aware that responses are conditional and based on the information you provide. Code compliance for a particular project is determined based on materials submitted in a permit application.)
- DCLU Energy Code Web site (http://www.cityofseattle.net/dclu/energy) contains a searchable version of the Washington State Energy Code with Seattle Amendments, definitions and downloadable worksheets, and links to DCLU Client Assistance Memos, State Building Code Council Interpretations, and professional association web sites.
- Client Assistance Memos: Following is a list of Energy Code related CAMs; most are available through the DCLU/Energy Code Web site:
  CAM 316 - Subject-to-Field-Inspection (STFI) Permits
  CAM 403 - NFRC Glazing U-factors and Solar Heat Gain Coefficient (SHGC)
  CAM 404 - True Seven-Day Programmable Thermostats (.pdf file)
  CAM 405 - Energy Efficient Lighting Equipment (.pdf file)
  CAM 406 - Outdoor Air Quality in the Puget Sound Area and the Implications for Building Ventilation Systems
  CAM 413 - Nonresidential Envelope Compliance Using the ENVSTD Program
  CAM 415 - Applicant Responsibilities/Plan Requirements for Mechanical Permits
  CAM 417 - Sun Chart: Determination of Solar Exposure (.pdf file)
  CAM 419 - Commissioning for Nonresidential Mechanical and Lighting Systems

Energy and Atmosphere: Seattle CIP Supplement

Energy Prerequisite 3: CFC Reduction in HVAC&R Equipment

LEED™ v2.0 Prerequisite Requirement:

- Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing base building HVAC equipment, complete a comprehensive CFC phaseout conversion.

Energy Credit 1: Optimize Energy Performance

2-10 points

Seattle CIP requirement: **minimum 2 points achieved for Energy Credit 1**

LEED™ v2.0 Credit Requirement:

- Reduce design energy cost compared to the energy cost budget for regulated energy components described in the requirements of ASHRAE/ IESNA Standard 90.1-1999, as demonstrated by a whole building simulation using the Energy Cost Budget Method described in Section 11.

New Buildings	Existing Buildings	Points
20%	10%	2
30%	20%	4
40%	30%	6
50%	40%	8
60%	50%	10

Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems as defined by ASHRAE.

Recognizing the inherent energy efficiency of the Washington State Energy Code with Seattle Amendments, this policy requires all projects to achieve a level of energy efficiency above the ASHRAE Standard 90.1 minimum. For a comparison of the two, see Appendix H: LEED ENERGY BASELINE FOR SEATTLE PROJECTS: A Comparison of *ASHRAE/IESNA Standard 90.1-1999* and the *1997 Seattle Energy Code* (Revised version: 2 February 2001).

Seattle CIP Supplement Requirement:

- All projects shall achieve a minimum of two points in Energy Credit 1. The baseline shall be the entire energy consumption of the building and associated systems. Calculations shall be performed in accordance with DCLU procedures for the annual energy analysis compliance option.

DOCUMENTATION:

- Project managers should expect documentation to be provided in accordance with DCLU requirements for Energy Code compliance using the annual energy analysis compliance option.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- Director's Rule 18-99, "Standard Design for Energy Code Analysis for Nonresidential Buildings" (http://www.cityofseattle.net/dclu/codes/Dr/dr1999-18.pdf.)
- Seattle Energy Code Section 1436: Fan systems which have both a capacity of 5,000 cfm or greater and which have a minimum outside air supply of 70% or greater of the total air circulation shall have a heat recovery system with at least 50% recovery effectiveness. Heat recovery energy may be provided from any site-recovered or site-solar source.

ADDITIONAL RESOURCES AND ASSISTANCE:

- Energy efficiency services and/or rebates for high efficiency equipment and controls from City Light (684-3254 / www.cityofseattle.net/light/conserve)
- Call the DCLU Technical Backup line at 684-7846 between 1:00 and 4:15 p.m. and ask for "Energy Technical Backup." You will need to schedule a meeting with Mechanical/Energy Plans Examination staff to discuss and establish annual energy analysis parameters.

Energy and Atmosphere: Seattle CIP Supplement

Energy Credit 2:
Renewable Energy

1-3 points

LEED™ v2.0 Credit Requirement:

- Supply a net fraction of the building's total energy use (as expressed as a fraction of annual energy cost through the use of on-site renewable energy systems).

% of Total Energy Cost in Renewables	Points
5	1
10	2
20	3

Seattle CIP Supplement Requirement:

- ❑ To receive credit, **the energy benefits from renewable/alternative energy must be above and beyond the energy measures employed to obtain energy efficiency credits.**

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ The Seattle Land Use Code (Title 23 of the Seattle Municipal Code) provides over-height allowances for rooftop solar collectors in some zoning districts. Check the code provisions for the particular land use zone in which the project will be located http://clerk.ci.seattle.wa.us/~public/code1.htm

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ The State of Washington provides an exemption on state corporate excise tax for the development of alternative energy resources, including renewable energy. The exemption is 100% and is available through July 1, 2004. Contact Jim Kerstetter of the WSU Cooperative Extension Energy Program (360) 956-2069 for more information. Additional incentives from the State for renewables and energy conservation may also be available.

Energy Credit 3:
Best Practice Commissioning

1 point

LEED™ v2.0 Credit Requirement:

- In addition to the Fundamental Building Commissioning prerequisite, implement the following additional commissioning tasks:
  1. Conduct a focused review of the design prior to the construction documents phase.
  2. Conduct a focused review of the construction documents when close to completion.
  3. Conduct a selective review of contractor submittals of commissioned equipment.
  4. Develop a system and energy management manual.
  5. Have a contract in place for a near warranty end or post-occupancy review.

  Items 1, 2, and 3 must be performed by someone other than the designer.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ DCLU Client Assistance Memo (CAM 419) - Commissioning for Nonresidential Mechanical and Lighting Systems; available at DCLU's Energy Code web site: http://www.cityofseattle.net/dclu/energy.

- ❑ Seattle City Light offers information, incentives and assistance for building owners commissioning services to large projects within its service area. For more information, please call 684-3274 or visit: http://www.cityofseattle.net/light/conserve/business/bdgcoma/cv5_bca.htm
- ❑ Building Commissioning Association-Northwest: http://www.bcxa.org/
- ❑ Washington Department of General Administration(GA): Commissioning Guidelines: find this document in Appendix I to these Supplements.

Energy and Atmosphere: Seattle CIP Supplement

Energy Credit 4: Elimination of HCFCs and Halons

1 point

LEED™ v2.0 Credit Requirement:

- Install base building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFCs or Halon.

ADDITIONAL RESOURCES AND ASSISTANCE:

❑ See EPA's page of acceptable substitutes for ozone-depleting substances at http://www.epa.gov/docs/ozone/title6/snap/lists/index.html or call the EPA Hotline at 800-296-1996. Substitutes have been reviewed on the basis of ozone depletion potential, global warming potential, toxicity, flammability, and exposure potential. This page contains lists both refrigerants and fire suppression systems.

Energy Credit 5: Measurement and Verification

1 point

LEED™ v2.0 Credit Requirement:

Comply with the installed equipment requirements for continuous metering as stated in Option B: Methods by Technology of the US DOE's International Performance Measurement and Verification Protocol (IPMVP) for the following:

- Lighting systems and controls.
- Constant and variable motor loads.
- Variable frequency drive (VFD) operation.
- Chiller efficiency at variable loads (kW/ton).
- Cooling load.
- Air and water economizer and heat recovery cycles.
- Air distribution static pressures and ventilation air volumes.
- Boiler efficiencies.
- Building specific process energy efficiency systems and equipment.
- Indoor water risers and outdoor irrigation systems.

DOCUMENTATION:

❑ Use of the IPMVP requires long-term documentation and reporting commitments to maintain this credit, which may affect the LEED™ rating depending on the number of credits a project earns.

- Project managers may **give preliminary credit for project documents that require performance measurement and verification as stated in Option B of the International Performance Measurement and Verification Protocol**.
- Implementation of a performance measurement and verification plan will be **considered fulfilled** and final credit taken by the project manager upon **completion of the plan and/or execution of a contract to complete the plan.**

ADDITIONAL RESOURCES AND ASSISTANCE:

☐ See **Appendix G** to these Supplements for a summary of IPMVP.

☐ A copy of the IPMVP may be ordered by calling 1-800-DOE-EREC (363-3732), or downloaded (http://www.ipmvp.org). A paper copy is also available at the Sustainable Building Resource Library in the DCLU Public Resource Center.

Energy and Atmosphere: Seattle CIP Supplement

Energy Credit 6:
Green Power

1 point

LEED™ v2.0 Credit Requirement:

- Engage in a two year contract to purchase power generated from renewable sources that meet the Center for Resource Solutions (CRS) Green-E requirements.

NOTE: Power purchased from Seattle City Light does not currently qualify for the Green Power credit. As of July 2000, City Light's hydroelectric dams do not qualify as Low Impact Hydropower. City Light is committed to zero net CO_2 emissions for all generation sources and is currently seeking long term purchase contracts for renewable generation resources.
See Green-e's description of hydro: http://www.green-e.org/what/hydropower.html

ADDITIONAL RESOURCES AND ASSISTANCE:

- Description of Green-e and its labeling system for power: http://www.green-e.org/what/index.html
- List of the certification requirements for utilization of the Green-e logo on power sources: http://www.green-e.org/power/require.html

Energy and Atmosphere: Seattle CIP Supplement

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Materials and Resources: Seattle CIP Supplement

As we know too well, here in our sometimes-damp Seattle region, all materials are trying to go back to the earth (from whence they came). If left in their original state the decaying process is pollution free; however, the minute we attempt to prevent this natural process through excavation or in some way modify the materials… the pollution process begins. Architects, engineers, interior designers and contractors all make their livings modifying materials in order to build buildings. Buildings, unfortunately, are responsible for more external pollution than any other product on the planet. About half the greenhouse gases produced each year by industrialized countries are related to buildings.[1]

Beyond a matter of style, how we design and build buildings is now a matter of survival. After eleven thousand years of building to protect ourselves from the environment, the delicate environment must now be protected from us[2]. The City of Seattle is committed to promoting this idea and to do its part in helping substantially reduce the root causes of global warming. This supplement on *Materials and Resources* will act as a useful guide toward this goal for the building industry and the rest of us occupying and maintaining the buildings in Seattle.

As a means of evaluating the environmental and economic impacts of new City buildings we are examining both *upstream* (manufacturing, mining, transportation) and *downstream* (the building's waste stream) conditions with a process called "green baselining." This methodology augments the standards required within LEED™ and may soon become a standard for all new City of Seattle buildings. In turn, this supplement provides assistance with materials and resources at both ends of the building process.

OVERVIEW OF SEATTLE-SPECIFIC MATERIALS AND RESOURCES REQUIREMENTS:

In addition to the LEED™ requirements, its is required that all projects comply with **all City Regulations** for building materials and their inclusion in new and existing construction projects, including the latest edition of the **Uniform Building Code (UBC) with the Seattle supplements.**

[1] Dorothy Mackenzie, Green Design, Designing for the Environment: Laurence King Publishing, 1997 p. 38

[2] Educating Architects for a Sustainable Environment (EASE) http://www.bsu.edu/ease/ease06.htm

Materials and Resources: Seattle CIP Supplement

Materials Prerequisite: Storage and Collection of Recyclables

LEED™ v2.0 Prerequisite Requirement:

- Provide an easily accessible area that serves the entire building that is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals.

Required

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ See the ordinance requiring storage space for solid waste and recycling materials containers: http://clerk.ci.seattle.wa.us/~public/CBOR1.htm(Enter Ordinance No. 119836 to view the ordinance text) or see the Appendices to this Supplement.
- ❑ The City's Waste Reduction and Recycling Policy: http://www.cityofseattle.net/environment/EMPPol-Perf.htm#_Toc444586591

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ "Design for Occupant Recycling" offers design strategies for office recycling: http://www.resourceventure.org/PDF%20files/occupant%20recycling.pdf. Seattle Businesses can call the BIRV technical assistance line for information, assistance and referrals regarding office waste reduction and recycling (389-7304).
- ❑ For questions on Seattle's requirements for storage space, contact Liz Kain of Seattle Public Utilities: 684-4166 / liz.kain@ci.seattle.wa.us

Materials Credit 1: Building Reuse

1-3 points

LEED™ v2.0 Credit Requirement:

Reuse large portions of existing structures during renovation or redevelopment projects.

- Maintain at least 75% of existing building structure and shell (exterior skin and framing excluding window assemblies) (**1 point**).
- Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing excluding window assemblies) (**1 point**).
- Maintain 100% of existing building structure and shell AND 50% non-shell (walls, floor coverings, and ceiling systems) (**1 point**).

Adaptive reuse of existing buildings is not only good for the environment; it helps maintain the ambience, scale, diversity, and convenience that often attract people to urban areas. The City of Seattle in conjunction with the local chapter of the American Institute of Architects champion the rehabilitation of existing buildings.

Materials and Resources: Seattle CIP Supplement

Materials Credit 2: Construction Waste Management

1-2 points

LEED™ v. 2.0 Credit Requirement:

Develop and implement a waste management plan, quantifying material diversion by weight.

- Recycle and/or salvage at least 50% (by weight) of construction, demolition, and land clearing waste (**1 point**).
- Recycle and/or salvage an additional 25% (75% total by weight) of the construction, demolition, and land clearing waste (**1 point**).

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ The Business and Industry Resource Venture offers free assistance in developing comprehensive waste reduction/recycling strategies for Seattle projects, including sample specs, and the document: "Construction Waste Management for LEED™" (www.resourceventure.org/PDF%20files/CWM%20for%20LEED.pdf) For more information, see http://www.resourceventure.org/construction.htm or call 389-7304.
- ❑ King County's *enCompass* web site offers sample bid and contract language related to construction recycling and waste management: http://www.metrokc.gov/procure/green/wastemgt.htm
- ❑ *The Contractor's Guide to Preventing Waste and Recycling* and *Seattle/King County Construction Recycling Directory* are available to help develop an on-site recycling plan and to find businesses and services to take recyclable materials. Available through the BIRV website (http://www.resourceventure.org/), or by calling the Business and Industry Resource Venture (389-7304).
  - ❑ *2000 Contractor's Guide to Preventing Waste and Recycling*: http://dnr.metrokc.gov/swd/bizprog/sus_build/ContrGde.pdf
  - ❑ *Construction Recycling Directory 2000/2001*: http://dnr.metrokc.gov/swd/bizprog/sus_build/CDLguide.pdf

Materials Credit 3: Resource Reuse

1-2 points

LEED™ v2.0 Credit Requirement:

- Specify salvaged or refurbished materials for 5% of building materials (**1 point**).
- Specify salvaged or refurbished materials for 10% of building materials (**1 point**).

See the LEED™ Reference Guide for calculation tools and guidelines. Percentages are in terms of dollars.

ADDITIONAL RESOURCES AND ASSISTANCE:

- ☐ King County's *enCompass* web site features sample specification language for incorporating salvaged and reused materials into projects:
  - ☐ Div. 0 sample: http://dnr.metrokc.gov/market/map/CKCenvpr.htm
  - ☐ Div. 1 sample: http://dnr.metrokc.gov/market/map/CKCReuse.htm
- ☐ Local (Seattle area) resources for finding salvaged materials:
  1. **RBME** http://www.rbme.com on-line building materials exchange.
  2. **Use it Again, Seattle!** http://www.cityofseattle.net/util/useitagain database of businesses involved in reuse, including building materials.
  3. **IMEX** (The Industrial Materials Exchange) also lists building materials: http://www.metrokc.gov/hazwaste/imex/
  4. **BIRV** http://www.resourceventure.org/ can help Seattle projects identify businesses involved in salvage and reuse operations.

Materials and Resources: Seattle CIP Supplement

Materials Credit 4:
Recycled Content

1-2 points

LEED™ v2.0 Credit Requirement:

- Specify a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material (**1 point**).
- Specify an additional 25% (50% total) of building materials that contain in aggregate, a minimum weighted average of 20% post consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material (**1 point**).

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ The City's "Buy Recycled" Policy. The basis for this policy can be found in the Municipal Code - (A) SMC 3.18.908 "Standards for recycled content." (B) SMC 3.18.910, "Price preference". View these sections of code by searching the City Clerk's site: http://clerk.cityofseattle.net/~public/code1.htm. Highlights of the Buy Recycled Policy are included in the Appendices to this document.
- ❑ The City's Environmental Management Policy, Section 6.12.4 sets priorities for solid waste management: http://www.cityofseattle.net/environment/EMPIndex.htm

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ Sample specification language related to recycled content can be found on King County's *enCompass* web site
  - ❑ Overall goals (Div 0): http://dnr.metrokc.gov/market/map/CKCenvpr.htm
  - ❑ Submittal Requirements: http://dnr.metrokc.gov/market/map/REISsubm.htm
  - ❑ Carpet: http://dnr.metrokc.gov/market/map/CKrecycl.htm
  - ❑ Gypsum board: http://dnr.metrokc.gov/market/map/REISgyp.htm
  - ❑ Fly ash in concrete: http://dnr.metrokc.gov/market/map/REIScem.htm
  - ❑ Rough carpentry: http://dnr.metrokc.gov/market/map/Thrfcarp.htm
  - ❑ Engineered wood/Surfaces: http://dnr.metrokc.gov/market/map/Thrcsus.htm
  - ❑ Tile: http://dnr.metrokc.gov/market/map/Thtile.htmand http://dnr.metrokc.gov/market/map/CKrecycl.htm
  - ❑ Insulation: http://dnr.metrokc.gov/market/map/Thinsul.htm and http://dnr.metrokc.gov/market/map/CKrecycl.htm
  - ❑ Rebar: http://dnr.metrokc.gov/market/map/CKCpt4.htm#REINFORCEMENT
- ❑ See the BIRV web site http://www.resourceventure.org/ or call their technical assistance hotline (389-7304) for strategies to increase recycled content materials use on your Seattle project, including help finding materials.
- ❑ King County *Construction Works Recycled Content Products Guide* http://dnr.metrokc.gov/swd/bizprog/sus_build/recycledcontentbuildingproducts.pdf) is a list of recycled content products by category, and lists Internet and hardcopy resources to assist finding additional recycled content products.
- ❑ King County's Environmental Purchasing Program http://www.metrokc.gov/procure/green/const.htmlists some construction materials and descriptions of product experiences. Also has vendor information.

Materials Credit 5:
Local/Regional Materials

1-2 points

LEED™ v2.0 Credit Requirement:

- Specify a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles (**1 point**).
- Of these regionally manufactured materials, specify a minimum of 50% that are extracted, harvested, or recovered within 500 miles (**1 point**).

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ See the Northwest Ecobuilding Guild's *Green Pages* Directory for local sources of products and services: http://www.ecobuilding.org/greenpages/index.html

Materials and Resources: Seattle CIP Supplement

Materials Credit 6: Rapidly Renewable Materials

1 point

LEED™ v2.0 Credit Requirement:

Specify rapidly renewable materials for 5% of total building materials.

Materials Credit 7: Certified Wood

1 point

LEED™ v2.0 Requirement:

Use a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council guidelines for wood building components including but not limited to framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- Seattle City Council Resolution 30015 directs the Executive Services Department to investigate the feasibility of increasing the percentage of the City's purchases of wood and wood products from businesses certified as practicing sustainable forestry. See the Appendix B to these Supplements for the language of the Resolution.

ADDITIONAL RESOURCES AND ASSISTANCE:

- King County's *enCompass* web site offers sample specification regarding certified sustainable harvest wood: http://dnr.metrokc.gov/market/map/REISgltm.htm
- http://www.fscoax.org/principal.htmForest Stewardship Council.

Materials and Resources: Seattle CIP Supplement

ADDITIONAL RESOURCES AND ASSISTANCE FOR CONSERVING MATERIALS

Information on job-site recycling and reuse:

- *2000 Contractors' Guide for Preventing Waste and Recycling* http://dnr.metrokc.gov/swd/bizprog/sus_build/ContrGde.pdf
- Business and Industry Resource Venture (389-7304) 1301 5th Ave. Suite 2400 Seattle, WA 98101 http://www.resourceventure.org/ (Click on "Sustainable Building") BIRV provides information to Seattle Business on waste reduction, recycling, and purchasing recycled content materials. Visit their Web site or call their technical assistance hotline for more information.
- *WasteSpec* is an invaluable resource for specifying waste reduction, job site recycling, and recycled content products. Download it **for free** from http://www.tjcog.dst.nc.us/cdwaste.htm
- *Construction Recycling Directory* http://dnr.metrokc.gov/swd/bizprog/sus_build/CDLguide.pdf
- List of Construction Recycling Case Studies http://dnr.metrokc.gov/swd/bizprog/sus_build/how_others.htm
- Reusable Building Materials Exchange http://www.rbme.com/ This online service lists used and surplus building materials in King and other Western Washington counties. Materials are offered for sale and for free.

Information on recycled content or other sustainable building materials:

- King County's enCompass web site http://dnr.metrokc.gov/market/index.htmcontains virtual tours of local projects utilizing recycled content and sustainable materials. Includes materials information and a specification writing tutorial and examples.
- *WasteSpec* is an invaluable resource for specifying waste reduction, job site recycling, and recycled content products. Download it **for free** from http://www.tjcog.dst.nc.us/cdwaste.htm
- Business and Industry Resource Venture technical assistance hotline: 389-7304 http://www.resourceventure.org/ (Click on "Sustainable Building")
- Construction Works Recycled Product Guide http://dnr.metrokc.gov/swd/bizprog/sus_build/recycledcontentbuildingproducts.pdf
- King County Procurement's on-line resource for recycled products http://www.metrokc.gov/procure/green/index.htm
- Oikos Catalog of Green Building Products: http://www.oikos.com
- California Integrated Waste Management Board's Recycled-Content Product (RCP) Database. http://www.ciwmb.ca.gov/ConDemo/Products/
- Harris Directory: A comprehensive database of sustainable building products and practices will be available online with a subscription shortly. Seattle businesses can contact the Business and Industry Resource Venture's Technical Assistance Hotline to inquire about obtaining customized lists of materials and products from this directory (389-7304).

Indoor Environmental Quality: Seattle CIP Supplement

Healthy, productive indoor environments share several elements: they reduce or eliminate occupants' exposure to hazardous substances (such as cigarette smoke, asbestos and volatile organic compounds); they provide fresh air, thermal comfort and occupant control over their environment; they afford access to daylight and views. Designing for these traits in a building can have a substantial positive impact on occupant satisfaction and productivity, and reduce potential liability. See City Light's Sustainable Demand Project Web site for a description of the benefits and avoided costs that result from a considered approach to improving the indoor environment (http://www.cityofseattle.net/light/conserve/sustainability/).

Since many City CIPs will house City employees and over 90% of a building's 30-year costs are spent on those that work there, attention to improving IEQ (indoor environmental quality) can yield benefits far outweighing the up-front costs of the measures. Productivity increases - documented gains of up to 16% - and reductions in worker absenteeism can accompany (and often dwarf) the energy savings associated with IEQ-enhancing strategies. On the reduced liability front, reducing occupants' chemical exposure from unhealthy building materials and furnishings, and design/construction methods to control for biological contaminants and infiltration of external pollutants can lower the risk of illness and related claims.

This supplement is intended to provide users with specific guidance in achieving enhanced indoor environmental quality through early design integration, sensible construction sequencing, careful construction practices, and thoughtful selection of materials. As in the Energy and Atmosphere section, building commissioning and performance measurement and verification plans will ensure enhanced indoor environmental quality is sustained throughout a building's lifetime.

In recognition of the importance of IEQ, the City is actively working to protect City employees and increase public awareness of the issue. The City's Environmentally Responsible Purchasing Policy lists pollutant releases and potential impact on human health and the environment as factors to be considered when selecting products. City Light's Sustainable Demand Project (referenced above) has produced a fact sheet on the benefits of increased comfort and better learning environments in public schools. City Light also promoted the Northwest Ecobuilding Guild and American Lung Association's Healthy House Professional Training Program.

Addressing IEQ issues early in the design process can significantly reduce up-front costs associated with creating healthy indoor environments. In contrast, remediation efforts related to indoor environmental problems are exceedingly costly. The IEQ resources and contacts listed in these Supplements will facilitate the creation of healthy indoor spaces and help your project reach the Silver level using the LEED Rating System™.

Indoor Environmental Quality: Seattle CIP Supplement

IEQ Prerequisite 1:
Minimum IAQ Performance

LEED™ v2.0 Prerequisite Requirement:

- Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality and approved Addenda.

Additional CIP Supplement Requirement; see below

The Seattle Mechanical Code and Washington State Ventilation and Indoor Air Quality Code provide minimum standards for indoor air quality, ventilation, and location and quantity of fresh air intake. These codes are derived from ASHRAE Standard 62-1989; therefore, complying with these codes may be considered equivalent to complying with the ASHRAE standard.

Seattle CIP Supplement Prerequisite:

- ❑ Comply with Seattle Mechanical Code and Washington State Ventilation and Indoor Air Quality Code.

DOCUMENTATION:

- ❑ Verification that as built conditions achieve design intent should occur during building commissioning. Ongoing performance measurement and verification should monitor continued operation at final design conditions.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ 1997 Seattle Mechanical Code: Chapter 4
- ❑ Washington State Ventilation and Indoor Air Quality Code (1997 Edition)
- ❑ Section 503 of the Seattle Energy Code: Building Mechanical Systems (http://www.cityofseattle.net/dclu/energy/res/sec503.htm)

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ Washington State Department of Health's Indoor Air Quality Program http://www.doh.wa.gov/ehp/ts/iaq.htm Web site includes fact sheets, contacts, publications, and links to related sites.
- ❑ DCLU Client Assistance Memo: Outdoor Air Quality in the Puget Sound Region and the Implication for Building Ventilation Systems, available online at http://www.cityofseattle.net/dclu/publications/cam/cam406.htm or by calling their publications desk at 233-3881
- ❑ EPA Indoor Air Quality Clearinghouse (800) 438-4318 and IAQ Information from EPA: http://www.epa.gov/iaq/
- ❑ American Lung Association (800) LUNG-USA. Also see the Lung Association's Web site on IAQ: http://www.lungusa.org/air/air_indoor_redux3.html

IEQ Prerequisite 2:
Environmental Tobacco Smoke (ETS) Control

Required

LEED™ v2.0 Prerequisite Requirement:

- Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR, by providing a designated smoking room designed to effectively contain, capture, and remove ETS from the building. At a minimum, the smoking room shall be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable structural deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 Pa (0.03 inches of water gauge). Performance of smoking rooms shall be verified using tracer gas testing methods as described in ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

Indoor Environmental Quality: Seattle CIP Supplement

Seattle Municipal Code provisions (see Referenced Standards, below) prohibit smoking in public areas.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- Seattle Municipal Code Section 10.64.020 - Prohibition
  Smoking is prohibited in the following public places:
  A. Elevators;
  B. Mass transportation vehicles, such as buses; except on chartered buses for private hire or in taxicabs clearly designated by the operator to permit smoking;
  C. Indoor facilities serving as museums, concert halls, theaters, auditoriums and exhibition halls, whether owned or occupied by The City of Seattle or by any other person; provided that smoking by performers as part of a theatrical production is permitted; and provided further that smoking may be permitted in designated areas including portions of lobbies, so long as such areas are physically separated from the spectator areas, lobbies and all other public areas;
  D. Indoor sports arenas, provided that smoking may be permitted in designated areas of lobbies, if the lobbies are physically separated from the spectator area;
  E. Hallways and waiting rooms of every health care facility including, but not limited to, hospitals, nursing homes, clinics and health departments, provided that smoking may be allowed in one or more designated, physically separate waiting rooms;
  F. All areas open to the public in buildings owned by The City of Seattle, provided that smoking may be permitted in designated smoking areas of the Seattle Center's "Center House" not to exceed thirty percent (30%)of the common area of the Center House;
  G. All areas open to the public within premises leased or rented by The City of Seattle;
  H. Public places which are part of shopping centers, retail stores and financial institutions, including, but not limited to department stores, banks, laundromats and barbershops; provided, that smoking may be allowed in the common areas of shopping malls;
  I. Classrooms and lecture halls of schools, colleges and universities;
  J. Rooms in which meetings and/or hearings open to the public are held;
  K. All public areas and waiting rooms of public transportation facilities including but not limited to bus, train, airport and ferry facilities; provided that smoking may be permitted in designated smoking areas that may not exceed thirty percent (30%) of the waiting area;
  L. All public restrooms including, but not limited to those found in all public places listed above;
  M. Libraries.
- 1997 Seattle Mechanical Code

IEQ Credit 1:
Carbon Dioxide (CO_2) Monitoring

1 point

LEED™ v2.0 Credit Requirement:

- Install a permanent carbon dioxide (CO_2) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time.

Indoor Environmental Quality: Seattle CIP Supplement

IEQ Credit 2:
Increase Ventilation Effectiveness

1 point

LEED™ v2.0 Credit Requirement:

- For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (E) greater or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of the air flow for at least 95% of hours of occupancy.

The Seattle Mechanical Code and Washington State Ventilation and Indoor Air Quality Code provide minimum standards for indoor air quality, ventilation, and location and quantity of fresh air intake. These codes are derived from ASHRAE Standard 62-1989; therefore, complying with these codes may be considered equivalent to complying with the ASHRAE standard.

Seattle CIP Credit Requirement:

- ❑ Comply with Seattle Mechanical Code and Washington State Ventilation and Indoor Air Quality Code.

DOCUMENTATION:

- ❑ Verification that as built conditions achieve design intent should occur during building commissioning. Ongoing performance measurement and verification should monitor continued operation at final design conditions.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ 1997 Seattle Mechanical Code: Chapter 4
- ❑ Washington State Ventilation and Indoor Air Quality Code (1997 Edition)

IEQ Credit 3:
Construction IAQ Management Plan

1-2 points

LEED™ v2.0 Credit Requirement:

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings Under Construction, 1995, AND protect stored on-site or installed absorptive materials from moisture damage, AND replace all filtration media immediately prior to occupancy (Filtration media shall have a Minimum Efficiency Reporting Value [MERV] of 13 as determined by ASHRAE 52.2-1999) (**1 point**).
- Conduct a minimum two-week building flushout with new filtration media at 100% outside air after construction ends and prior to occupancy, OR, conduct a baseline indoor air quality testing procedure consistent with current EPA protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445 (**1 point**).

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ EPA Protocol for Environmental Requirements referenced under bullet #2 can be found on the Web: http://www.epa.gov/rtp/new-bldg/environmental/s_01445.htm
- ❑ Washington State Department of General Administration Indoor Air Quality Guidelines: Section **5.0 Additional Environmental Controls**

5.1 To prevent and/or inhibit the degradation of IAQ in adjacent occupied buildings during construction, the following shall be observed:

5.11 Minimize the amount of construction dust, vapors and fumes generated at the construction site;

5.12 Provide temporary source of outdoor air, if required, to prevent construction dust and fumes from infiltrating into the adjacent building's mechanical system;

and,

5.13 Recondition the air systems of adjacent buildings, affected by the construction project, to at least the pre-construction cleanliness conditions.

5.2 To prevent and/or inhibit the degradation of indoor air quality in occupied portions of buildings during renovation projects, the following shall be observed:

5.21 If possible, schedule renovation projects to occur during favorable weather seasons and/or conditions;

5.22 Separate and section off the area where renovation is to be performed from the remaining space or perform work during non-operating hours. Space shall be thoroughly cleaned and flushed with outdoor air prior to occupancy; and,

5.23 Prevent construction dust and fumes from infiltrating into the building's mechanical system.

IEQ Credit 4: Low-Emitting Materials

1-4 points

LEED™ v2.0 Credit Requirement:

Meet or exceed VOC limits for adhesives, sealants, paints, composite wood products, and carpet systems as follows:

- Adhesives must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 by, AND all sealants used as a filler must meet or exceed the Bay Area Air Quality Management District Reg. 8, Rule 51 (**1 point**)
- Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements (**1 point**)
- Carpet systems must meet or exceed the Carpet and Rug Institute Green Label Indoor Air Quality Test Program (**1 point**)
- Composite wood or agrifiber products must contain no added urea- formaldehyde resins (**1 point**)

SUMMARY OF CITY OF SEATTLE STANDARDS:

- Washington State Ventilation and Indoor Air Quality Code: Section 401 – Pollutant Source Control

  Section 401.1 Formaldehyde Reduction Measures: All structural panel components within the conditioned space such as plywood, particle board, wafer board, and oriented strand board shall be identified as "EXPOSURE 1", "EXTERIOR", OR "HUD-APPROVED".
- Washington State GA Indoor Air Quality Guidelines: Section 3.0

3.0 Indoor Pollutant Source Control Plan

The A/E shall develop and implement an Indoor Pollutant Source Control Plan indicating how the Emission Rate Standards that follow will be implemented. The Plan shall apply to all interior construction materials, finishes and furnishings including partitions, wall coverings, flooring, floor coverings, ceiling tiles, adhesives, paints, sealants, glazes, insulation, duct work, wiring and other materials which may have chemical content.

3.1 Design documents shall require that all appropriate suppliers be made aware of the IAQ goals and the requirements to comply with the Emission Rate Standards.

3.2 Where possible, materials used shall emit the lowest, yet technologically achievable, emissions of chemical vapors and particles.

3.3 Emission Rate Standards :

3.31 **Formaldehyde Emission Rate Standard:** The product emission rate shall not result in an indoor air concentration level of formaldehyde greater than 0.05 parts per million.

3.32 **Total Volatile Organic Compound (VOC) Emission Rate Standard:** The product emission rate shall not result in an indoor air concentration level greater than 0.5 mg/m^3 of total volatile organic compounds.

3.33 **4 Phenyl Cyclohexene (4-PC) Emission Rate Standard:** The carpet

emission rate shall not result in an indoor air concentration level greater than 1 part per billion.

3.34 **Total Particulates Emission Rate Standard:** The product emission rate shall not result in an indoor air concentration of greater then 50 ug/m^3 total particulates.

3.35 **Regulated Pollutant Standard:** Any pollutant regulated as a primary or secondary air pollutant shall meet an emission rate standard that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard (USEPA, Code of Federal Regulations, Title 40, Part 50).

3.36 **Other Pollutant Standard:** Any pollutant not specifically mentioned in subparagraphs 3.3.1 through 3.3.4 shall meet an emission rate standard that will not produce an air concentration level greater than 1/10 the Threshold Limit Value - Time Weighted Average (TLV-TWA) industrial workplace standard.

3.4 As part of the Shop Drawing process, the A/E shall include a requirement that the contractor provide compliance information and Material Safety Data Sheets (MSDS) on all indoor construction material. Additionally, that the contractors disclose, in writing and prior to installation, information on those VOCs found to be emitted by the products and known to be carcinogens, mutagens, reproductive toxins, or compounds that emit greater than 1/10 the TLV-TWA.

3.5 All emission rate testing pertinent to air quality shall be done in accordance with ASTM D5116-90, Small Scale Environmental Determination of Organic Emissions from Indoor Materials/Products. All test data shall be made available to the State at its request.

3.6 The least amount feasible of "wet" materials (such as adhesives, sealants, glazes, caulks, paints, etc.) shall be used during construction and product applications. The Plan shall include control strategies for achieving this minimal use requirement.

3.7 "Dry" furnishing materials (such as carpet, acoustical panels, textiles, etc.) shall not be installed until "wet" materials have been applied and allowed to dry to the extent feasible and in accordance with other good building practices. Drying times should be chosen so that pollutant emission rates as set forth above are achieved prior to installation of the "dry" furnishings.

3.71 All dry furnishing and materials (such as carpet, floor tile, acoustical tile, textiles, office furniture, wood shelving, etc.) shall be allowed to "air-out" in clean environments prior to installation in a building.

3.72 All indoor construction material shall be protected from contamination by construction dust, debris, and fumes during all phases of construction, both before and after installation.

ADDITIONAL RESOURCES AND ASSISTANCE:

- King County's *enCompass* site features a sample specification for low-toxic, low-VOC paint: http://dnr.metrokc.gov/market/map/Thpaint.htm.

Indoor Environmental Quality: Seattle CIP Supplement

IEQ Credit 5:
Indoor Chemical and Pollutant Source Control

1 point

LEED™ v2.0 Credit Requirement:

Design to minimize cross-contamination of regularly occupied areas by chemical pollutants:

- Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

IEQ Credit 6:
Controllability of Systems

1-2 points

LEED™ v2.0 Credit Requirement:

- Provide a minimum of one operable window and one lighting control zone per 200 s.f. for all occupied area within 15 feet of the perimeter wall (**1 point**)
- Provide controls for each individual for airflow, temperature, and lighting for 50% of the non-perimeter, regularly occupied areas (**1 point**).

IEQ Credit 7:
Thermal Comfort

1-2 points

LEED™ v2.0 Credit Requirement:

- Comply with ASHRAE Standard 55-1992, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone (**1 point**).
- Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/or dehumidification systems in the building (**1 point**).

The Washington State Energy Code with Seattle Amendments (see the DCLU Energy Code Web site address under Resources, below) and DCLU Director's Rule 18-99 (http://www.cityofseattle.net/dclu/Codes/dr/dr1999-18.pdf) establish standard design conditions for Energy Code analysis of nonresidential buildings.

Seattle CIP Supplement Requirement:

- ❑ Interior Design Conditions: Heating: 70°F Cooling: 75°F
  Unless special design conditions justify other values.

SUMMARY OF CITY OF SEATTLE STANDARDS:

- ❑ Washington State Energy Code with Seattle Amendments: Reference Standard RS-29, Commercial Building Design by Systems Analysis, Section 3.6 - Controls
- ❑ DCLU Director's Rule 18-99 (see web site address, above)

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ DCLU Energy Code Technical Backup: (684-7846) Hours: 1 – 4:15 p.m.
- ❑ DCLU Energy Code Website: www.cityofseattle.net/dclu/energy/

Indoor Environmental Quality: Seattle CIP Supplement

IEQ Credit 8:
Daylight and Views

1-2 points

LEED™ v2.0 Credit Requirement:

- Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight (**1 point**).
- Direct line of sight to vision glazing from 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas (**1 point**).

ADDITIONAL RESOURCES AND ASSISTANCE:

- ❑ The Lighting Design Lab can help with daylighting questions, and provide free daylighting consultations: http://northwestlighting.com/ or call 325-9711.